

Journal of Mycology

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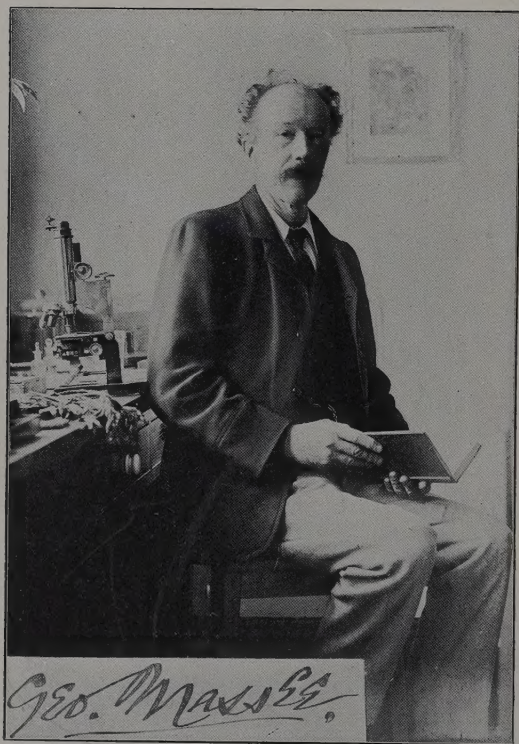
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A NEW PLOWRIGHTIA FROM GUATEMALA.*

W. A. KELLERMAN.

A conspicuous disease of the American Century plant, *Agave americana*, was noticed in Guatemala, C. A., the past two winters. The fungus attacks the living leaves at one or a few points, the infection then proceeding rapidly until the entire leaf may be involved. The clusters of the conspicuous fruiting bodies occupy suborbicular or oval spots which are very striking on account of their size and red or yellowish-red color, later turning brown and finally black.

Microscopic examination reveals the presence of a conidial layer on the outer surface of the stromata, shown in Fig. 3, Plate 90. The conidial cells as well as the hyphae of the outer portion of each stroma, are a bright brownish or yellowish color, under the microscope nearly hyaline.

The stromata are arranged in concentric rows as shown in Fig. 1, the central ones rupturing the epidermis first, later others appearing, but the outermost incipient fruiting bodies never succeed in uplifting the epidermis, though discoloring it. New spots of infection or rather central points of rupture by the stromata may be very close to older ones, and thus there is an effused area occupied by the fruits. Often the entire leaf, most commonly the upper portion, or only spots here and there, especially toward the apex, are involved. Both sides of the leaf show the con-

* Contributions from the Botanical Laboratory of the Ohio State University. XXVI.

Contribution to Guatemalan Mycology. II.

spicuous stromata, but as a rule one side has fewer spots; sometimes it is the upper surface of the thick fleshy leaf, sometimes the lower that shows more conspicuous and abundant infection.

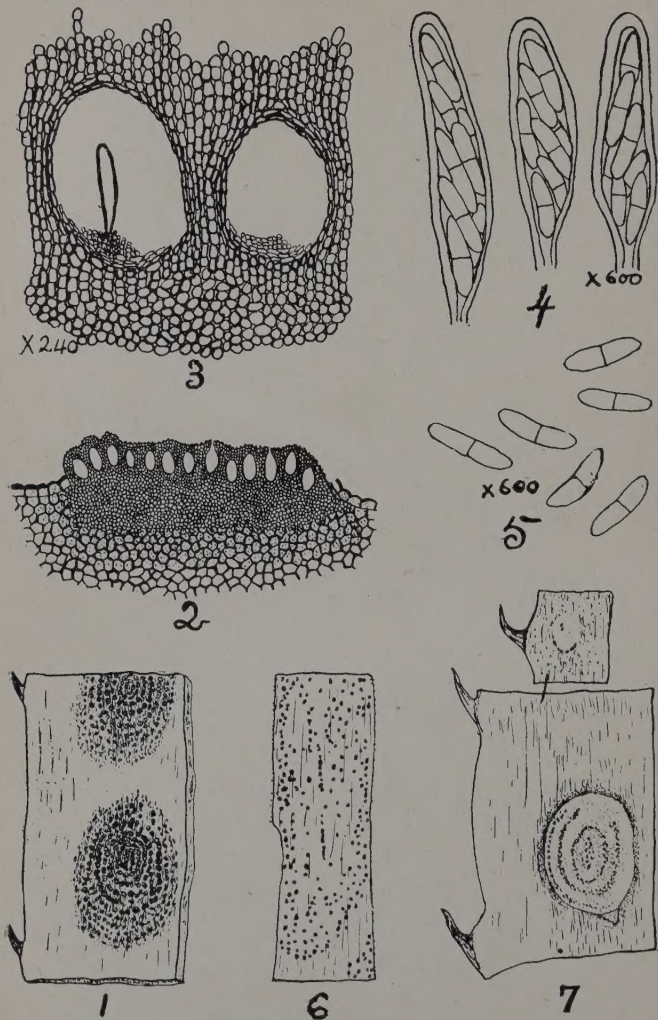
The fungus is a species of *Plowrightia* apparently undescribed. Tracy and Earle published, in the Bulletin of the Torrey Botanical Club, March 1901, p. 187, a species of this genus under the name of *Plowrightia circumscissa*, which they gave as occurring "on languishing leaves of some aloe (*Agave* sp. ?)," collected in Florida. When this was compiled by Saccardo for the Sylloge the host name "Aloe" was omitted and the entry was made as follows: "in foliis languidis *Agaves* spec." Some of the material from Tracy and Earle's type No. was kindly furnished me from the Missouri Botanical Garden where, Prof. Tracy informed me, his collections had been sent. After thus passing through Dr. Trelease's hands I find the host given on the label as *Yucca gloriosa* (*Y. aloifolia*). It seems certain therefore that Tracy and Earle's host is not an *Agave* as mine is. At any rate my *Plowrightia* is very different, both in microscopic characters and especially in the appearance and disposition of the stromata. Compare Fig. 1, which shows two spots of the fungus here in question, and Fig. 6, which presents a portion of a leaf affected by *Plowrightia circumscissa* Tracy & Earle. A specimen of my material sent to Prof. Tracy elicited the reply: "Very different from mine."

Another fungus somewhat similar in outward appearance to the *Plowrightia*, also collected in Guatemala, is shown in Fig. 7. It is *Colletotrichum agaves* Cav. No evidence was found to verify the suspicion at first entertained that the two might be forms of one and the same life cycle. Hedgecock reports (Annual Report of the Missouri Botanical Garden, 16:153-6. 1905) a study of this fungus, and he says "no ascigerous stage was found."

The technical description of the *Plowrightia* is given below. I have selected the specific name in honor of Mr. G. F. Williamson, of Guatemala, whose courtesies materially assisted in the botanical explorations both of 1905 and 1906. Mr. R. A. Young assisted in the study of the fungus and he and Mr. L. A. Hawkins prepared under my direction the illustrative drawings.

Plowrightia williamsoniana Kellerm. n. sp. Stromata rupturing the epidermis, prominent, globular to sub-quadrangular or oblong, $\frac{1}{4}$ - $\frac{3}{4}$ mm. high, $\frac{1}{2}$ -2 mm. long, arranged concentrically in five to ten (or more) somewhat irregular rows, the inner larger, the outermost poorly developed and scarcely lifting the epidermis, forming at first a definite suborbicular or oblong spot, but later fusing with adjacent affected areas, in many cases finally occupying nearly or quite the entire leaf.

The stromata are at first reddish yellow, becoming gradually brown, and finally black, the surface minutely papillate, the sub-



PLOWRIGHTIA WILLIAMSONIANA KELLERM. (figs. 1-5); P. CIRCUMSCISSA TR. & EARLE (fig. 6); COLLETOTRICHUM AGAVES CAV. (fig. 7).

stance somewhat brittle but not carbonaceous. The upper portion of the pseudoparenchyma is conidiiferous, producing an abundance of oblong to subglobular reddish or hyaline cells, $7-10 \times 3-5 \mu$.

The perithecial cavities are numerous (sometimes 40 or more in a stroma), $110-125 \times 90-120 \mu$; asci numerous, oblong or subovate-oblong, the basal part narrowed, $60-90 \times 12-20 \mu$ (mostly $80-85 \times 14-16 \mu$), thick-walled, containing 8 subdistichous, subequal, 2-celled, oval-oblong, yellowish or hyaline spores, $20-26 \times 5-7 \mu$ (mostly $22-24 \times 5-6 \mu$). No paraphyses were seen.

On living and languishing leaves of *Agave americana*, near Guatemala city, C. A., alt. 1200-1800 m. (Circ. 4,000-6,000 ft.) W. A. Kellerman Nos. 4629, 4630, 4631, January and February 1905.

Plowrightia williamsoniana Kellerm. n. sp.—Stromatibus epidermidem rumpentibus, prominentibus, globosis, vel sub-quadrangularis vel oblongis, $\frac{1}{4}-\frac{3}{4}$ mm. altis, $\frac{1}{2}-2$ mm. longis, in 5-10 (vel pluribus) lineis sub-irregulariter concentricis dispositis, intimis majoribus, extimis haud multum evolutis, epidermidem vix levantibus, primum maculam definitam sub-orbicularem vel oblongam efformantibus, dein cum adjacentibus arcis affectis confluentibus, saepe folio partim vel omnino tandem infecto. Stromatibus primum fulvis, dein fuscis, denique nigris, superficie minute papillata, substantia subfragili non carbonacea, parte superiore parenchymatis conidiifera, cellulas numerosas oblongas vel sub-globulares rubentes vel hyalinas abscindente, $7-10 \times 3-5 \mu$. Loculis perithecialibus numerosis (plerumque 40 vel pluribus uno in stromate), $110-125 \times 90-120 \mu$; asci numerosis, oblongis vel subovato-oblongis, parte inferiore attenuata, $60-90 \times 12-20 \mu$ (saepissime $80-85 \times 14-16 \mu$), parietibus crassis, octosporis, sporis subdistichis, sub-aequaliter bilocularibus, ovali-oblongis, subfulvis vel hyalinis, $20-26 \times 5-7 \mu$ (plerumque $22-24 \times 5-6 \mu$). Paraphyses non apparent.

In foliis vivis languidisque *Agaves americanae*, prope urbem Guatemalam, Amer. cen., alt. 1,200-1,800 m., W. A. Kellerman, 4629, 4630, 4631, in mensibus Jan. et Feb. MCMV.

EXPLANATION OF PLATE 90.—**Plowrightia williamsoniana Kellerm.** Fig. 1. An affected area of a leaf of *Agave americana*, showing the concentric arrangement of the stromata; fig. 2, diagram of a single stroma in vertical section; fig. 3, section of a portion of a stroma, showing two perithecial cavities and exhibiting the superficial conidiiferous layer; fig. 4, asci; fig. 5, spores; fig. 6, *Plowrightia circumscissa* Tr. & Earle on some *Aloe*; fig. 7, *Colletotrichum agaves* Cav. on *Agave americana*.

A NEW CLASSIFICATION OF THE UREDINALES.

BY J. C. ARTHUR.

Separates of the paper on *Eine Klassifikation der Uredineen*, read by the present writer before the International Botanical Congress at Vienna in July, 1905, were distributed early in August of the present year to many Journals and Libraries, and to a large number of mycologists. Some of the phylogenetic reasons which are made the basis of this latest attempt at a natural arrangement of the genera of rusts have been more or less fully stated in other communications already before the public. The present occasion may be seized to state some of the aids and difficulties that will beset the practical acceptance of the classification.

The simplicity of the old order of things disappears in this new arrangement, and herein will doubtless arise one of the strongest protests against it. When nine-tenths of all forms of rusts usually met with were easily assigned to the *Uromyces-Puccinia* group, and if they had one-celled teliospores were species of *Uromyces*, or two-celled teliospores were species of *Puccinia*, or if they happened to be aecia were species of *Aecidium*, the naming of rusts seemed an easy matter to the casual student. But in the new system it is essential that something of the life history be known, including the number of spore forms, and the structure of the sorus. Before, any species with a two-celled, stalked teliospore might be safely called a *Puccinia*; but now, such a species may rest in any one of thirteen genera. Before, it did not matter whether pycnia (spermogonia) accompanied the telia, or other spore stages, or not; but now such association is often of fundamental importance in the location of a species in the system. Heretofore, the structure of the urediniosorus has been of slight systematic value; now, examination of this feature alone may place the species in the correct genus, or within a small group of genera. Such requirements for the naming of collections necessitate a more intimate knowledge of the rusts as a whole, some insight into their life-history and some appreciation of their structure. For this reason the system may not for a time prove as acceptable as the one in present use.

There are, however, some short cuts to sufficient information to enable one to name his collections. Thus, telia associated with pycnia may be safely assumed to belong to a genus in which aecia and uredinia are wanting, or at most so little developed as to be of no taxonomic importance. In like manner pycnia associated with uredinia, the so-called primary uredinia, may be assumed to indicate a genus in which aecia are wanting. If aecia show telia arising within or about them from the same

mycelium, it may safely be assumed that no uredinia belong to the life-cycle. Furthermore, it rarely or never happens that teliospores of the *Uromyces-Puccinia* type, germinating immediately upon maturity, belong to genera with other spore forms in the life cycle, excepting the largely tropical genera of *Erioporangium* and *Argotelium*.

Short cuts are also available in other directions. All gramineous and cyperaceous hosts bear rusts that may be assumed to possess all spore forms and are heteroecious, only one exception being positively known at present. Rusts on rosaceous hosts largely belong to the genera of the sub-family *Phragmidiatae*, and on leguminous hosts largely to genera of the sub-families *Raveneliatae* and *Uropyxidatae*, and so on.

But probably one of the most efficient short cuts, and a wholly legitimate one, owing to the phylogenetically intimate relation of fungus and host among the rusts, will eventually be the consultation of a host index. In the present chaotic condition of taxonomic literature in this group no very comprehensive indexes exist, but they are likely to be provided in the early future. By this means it can be readily ascertained what species have been recognized upon the host in question, and from this list, usually small, not much difficulty will be experienced as a rule in locating the particular rust.

Another difficulty in using the new system will probably be felt in the much larger number of genera to be recognized. Some of these genera have been long known, but only partially accepted, and consequently little used, like *Pileolaria*, *Uropyxis*, *Trachyspora*, *Gymnoconia*, *Kuehneola*, *Erioporangium*, and *Dasyspora*. Not being well understood, they have remained monotypic, or with only a few species each, although every one of these genera really contains more than one and some many species. Other genera have been established to receive species which show relationships quite different from those usually assumed for them. Thus, *Transschelia* and its closely associated genera have many characters showing their close relationship with the *Ravenelia* group, and have only superficial resemblances to the *Puccinia-Uromyces* group in which they have heretofore been submerged. But probably the most striking innovation is the placing of like species under different genera, according as they possess all or part of the spore forms in their life cycle. At first thought this seems to be an appropriation of the Schroeterian biological classes, into which every genus was considered to be potentially divisible, *i. e.*, heteroforms, autoforms, opsisforms, brachyforms, hemiforms, microforms, and leptiforms, and calling these classes genera. But in reality the basis of the segregates which I have recognized, for example, *Dasyspora* with teliospores, *Bullaria*, with urediniospores and teliospores, *Allodus* with aeciospores and teliospores, and *Dicaeoma* with all spore forms which take the

place of the genus *Puccinia* as now commonly used, rests upon a wholly different consideration, having to do fundamentally with the progressive evolution of the rusts, and not with adaptations. While space does not permit the presentation of an argument sufficiently full to demonstrate this proposition and carry conviction, yet it may be pointed out that while the genus *Dasyscypha* includes species, all of which have progressed in their evolution to the stage where the aeciospores and urediniospores have been effectively suppressed from the life cycle, yet it includes both leptoforms and microforms, according to their adaptations to the requirements of the environment, some species exhibiting only one or the other adaptation, and some assuming either form, now one, now the other, in accordance with conditions affecting growth not yet made clear. In the same way autoecism and heteroecism are regarded as adaptations, and not as an evolutionary development of generic rank. Having set up this principle, it becomes logical to separate *Gallowaya* from *Colcosporium*, *Chrysomyxa* from *Melampsoropsis*, *Macalpinia* from *Uromycladium*, *Dendroecia* from *Ravenelia*, *Calliospora* from *Uropyxis*, *Nyssospora* from *Triphragmium*, *Telospora* from *Nigredo*, etc. But it would be a wholly false impression to assume that this character of the suppression of spore forms is the only one separating the genus from the others of its group. It is the most prominent and the most easily stated, but in most cases will be found associated with other characters of acceptable value.

There is another argument beside that based upon phylogeny for the separation of species into genera as indicated above, and that is, convenience. It will lead, it is believed, to a better recognition of the various forms that go to make up each species, particularly valuable in the exploration of new or old floral regions, and also will permit clearer concepts in discussions relating to phylogeny, ecology, distribution, cytology, and a host of other problems. Even if there are those who do not admit the validity of the claim for true generic characters underlying the genera in question, they must accord the right to establish among the rusts, a group of organisms where parasitism of the most obligatory nature has constantly reduced the number of chances for displaying diversified characters, while increasing the physiological sensitiveness of the fungus to variations in the host, genera of this kind so long as they are as useful for the genuine increase of knowledge as have been the genera *Puccinia* and *Uromyces*, which are separated upon no better grounds than those advocated for the genera in question, if in fact as good, and no one, so far as the writer knows, has seriously insisted upon merging these two genera.

A few words may be said in regard to the nomenclature. The generic names have been chosen, such as are not new, in accordance with the American doctrine of types as applied in

the Philadelphia code. This course will doubtless be accepted as natural, whether considered best or not, seeing that the author was a member of the committee that drafted the code, and that he has on several subsequent occasions affirmed his belief in the essential validity of the principles which underlie the code. Granting the method of procedure, there is no need in this place to take up the question of the correct application of the several names; that may for the present be left to others. There are two names, that the establishment of types and application of the rule of priority have brought uppermost, *i. e.*, *Uredo* and *Accidium*, which may lead to some confusion and inconvenience. Yet the number of species in the true genus *Uredo* and true genus *Accidium* as distinguished from the form genera of these names, are so few, that the little inconvenience may be endured for the sake of correct method and final result. It is noteworthy that *Accidium* as a genus name, supplied the basis, according to many authors, for the name of the order, while *Uredo* since 1825 has been chiefly employed in this way, and is now firmly established as the genus on which the order *Uredinales* is founded.

A word may be said by way of explanation regarding the method of citation. The manuscript was prepared in accordance with the American method, but the printed proof submitted showed an evident editorial intention to have it changed to the German method, an intention most imperfectly carried out by the compositor. The typographical errors may be ascribed to the intricacies of this transformation, which diverted attention belonging to legitimate proof reading.

There is one question which is likely to come up in the mind of the reader, which finds no answer in the published article, that is, regarding the status of such forms as are too imperfectly known to be placed with much confidence in any of the recognized genera. The author proposes in his own work to retain such names as *Peridermium*, *Cacoma*, *Roestelia*, *Uromyces* and *Puccinia* as form genera for imperfectly understood species, and even *Uredo* and *Accidium* in their customary acceptance as form genera, if a better course does not become evident. These will constitute an *Anhang* for recording undistributed and imperfectly known forms.

Purdue University, Lafayette, Indiana.

A NEW ANTHRACNOSE OF ALFALFA AND RED CLOVER.

SAMUEL M. BAIN AND SAMUEL H. ESSARY.

In a preliminary note on clover diseases in Tennessee [Science, N. S. 17:503, 1905], we announced the discovery of a new clover disease in this State; caused by an undescribed species of *Colletotrichum*. Experiments have been under way for some time with a view to working out the life history of the fungus, as well as to the breeding of a resistant strain of clover. We have apparently succeeded in our effort to secure resistance, while our work on the life history of the fungus is as yet incomplete. This necessitates the publication of a Bulletin on the breeding experiments and economic aspects of the disease before the final publication on the biological relations of the parasite producing it; hence, we thought best to publish here a description of the species.

After the publication of the above mentioned preliminary note, we had opportunity to compare notes and specimens with Mrs. Flora W. Patterson of the U. S. Department of Agriculture, to whom a similar species occurring on alfalfa had been submitted by Mr. J. M. Westgate. The two forms appeared to be taxonomically identical, and our further field observations during the summer of 1906 support this view. Our knowledge of its injury to alfalfa is quite limited, though the disease occurred rather abundantly on this plant here this year. In Virginia, where the disease was first found on alfalfa by Mr. Westgate, it is said to have caused serious damage to the crop. There has been considerable complaint on the part of the farmers in Tennessee of the difficulty of securing a stand of alfalfa, and it is quite probable that this disease is at least partly responsible for the trouble.

The devastation caused in clover fields by the disease here in Tennessee is remarkable. It occurs over the entire state, but appears to be much worse where clover has been cultivated for many years. In fact, our observations thus far would justify the statement that it is the most serious plant disease occurring in this State.

The geographical extent of this anthracnose will be a matter of interest. We have observed it at one point each in Arkansas (Clarendon) and Kentucky (Hopkinsville). Its occurrence in Ohio and West Virginia is stated in the Yearbook of the Department for 1905; hence, it is probably widespread over the country.

There appear to be in the case of clover two critical periods when it is especially susceptible to the disease. The first is when

seedlings of the previous spring's sowing encounter the first prolonged hot spells of summer. At this time the disease usually attacks the petioles. This appears to be the period of greatest injury. The other period of special susceptibility is during the ripening of the seed, when the severest attacks are on the stems just at or slightly below the surface of the ground. Many flower heads are also killed about flowering time by attacks just below, but the host plant as a whole appears usually to survive. These statements are only general in character, however, for the plant may succumb to the disease at any time during the summer or early fall.

We have named the species *Colletotrichum trifolii*, and append the following description:

Colletotrichum trifolii Bain sp. nov.—Maculis atris vel fuscis, saepe depressis; acervulis erumpentibus, sparsis vel gregaris; basidiis hyalinis, cylindricis vel fusoides, conidiis prope aequalibus; conidiis hyalinis, rectis, utrinque rotundatis, $3-4 \times 11-13\mu$; setulis cum conidiis, continuis vel uniseptatis, paucis vel numerosis, fuligineis, ad apicem pallidioribus, $4-7 \times 39-62\mu$, saepe sinuosis vel nodulosis.

Habitat in vivis caulibus et petiolis, rarissime in foliis *Trifolii pratensis* et *Medicaginis sativae*, Tennessee, Kentucky, Arkansas; Virginia (J. M. Westgate); West Virginia, Ohio (Yearbook U. S. Department of Agriculture, 1905, p. 609).

University of Tennessee, Knoxville.

TWO NEW SPECIES BELONGING TO NAUCORIA AND STROPHARIA.

GEO. F. ATKINSON.

Material received from Prof. W. A. Kellerman and Supt. M. E. Hard, Central Ohio, prove to be undescribed species of fungi. The diagnoses of these two forms are given below; the first is also illustrated by a half-tone from photograph made by the collector.

Naucoria paludosella Atkinson n. sp.

20076.

Photographed Coll.

Growing on living sphagnum, other mosses and on rotten wood, Sphagnum moor, Buckeye Lake (Cranberry Island), Ohio, W. A. Kellerman 4464, Sept. 1905, and M. E. Hard and W. A. Kellerman, Oct. 1906. (4916, W. A. K.)

Plants 6-8 cm. high; pileus $2\frac{1}{2}$ -3 cm. broad; stems 3-4 mm. thick.

Pileus viscid when moist, convex to expanded, in age somewhat depressed, clay color, darker over center, often with appressed clay brown scales with a darker color.

Gills raw umber to Mars brown (R), emarginate, adnate, sometimes with a decurrent tooth, easily becoming free.

Cystidia on sides of gills none, edge of gills with large hyaline thin-walled cells, subventricose, sometimes nearly cylindrical, abruptly narrowed at each end with a slight sinus around the middle.

Spores subovate to subelliptical, subinequilateral, smooth, 7-9x4-5 μ , fuscous ferruginous, dull ochraceous under microscope.

Stem same color as pileus but paler, cartilaginous, floccose from loose threads or in some cases abundant threads over the surface, becoming hollow, base bulbous, the extreme base covered with whitish mycelium.

Veil rather thick, floccose, disappearing leaving remnants on stem and margin of pileus when fresh.

***Stropharia hardii* Atkinson n. sp.**

20118. Photographed G. F. A. Chillicothe, Ohio, received October 17, 1906, M. E. Hard No. 8.

Plant 10 cm. high; pileus 9 cm. broad; stem 1½ cm. thick.

Pileus pale bright ochraceous; gills brownish near Prout's brown (R); stem pale yellow tinge.

Pileus convex to expanded, thick at the center, thin toward the margin, smooth; flesh tinged yellow.

Gills subelliptical to subventricose behind, broadly emarginate, adnexed.

Basidia 4-spored.

Spores suboblong, smooth, 5-9x3-5 μ , purple brown under the microscope.

Cystidia not very numerous on sides of gills, varying from clavate to subventricose to sublanceolate, the free end more or less irregular when narrow, rarely branching below the apex and usually with a prominent broad apiculus or with two or several short processes. Similar cells on edge of gills, but somewhat smaller and more regular.

Stem even at the base, tapering to a short root, transversely floccose scaly both above and below the ring. The ring membranous, not prominent but still evident, about 2 cm. from the apex.

EXPLANATION OF PLATE 91. — Photograph of fresh specimens of *Naucoria paludosella* Atkinson. Young specimens with the pileus unexpanded to the left below; above older plants with upturned cap; the plant over the black background shows the conspicuous clay brown scales of the pileus.



NAUCORIA PALUDOSELLA ATKINSON.

NORTH AMERICAN SPECIES OF LEPIOTA.

A. P. MORGAN.

(Continued from p. 159).

III. GRANULOSAE. *Dermis of the pileus or at least its outer layer composed of granules, minute warts or furfuraceous particles; the investment of the stipe similar to that of the pileus; the veil of like structure, lacerate and appendiculate.*

The species of this tribe are mostly small Agarics growing on the ground in rich soils or on rotted wood. The granules form a loose, easily detached investment. Many species are enumerated.

a. *Lamellae adnate to the stipe.*

13. LEPIOTA AMIANTHINA SCOPOLI. FL. CARN. 1772.

Pileus ovoid then campanulate and explanate, subumbonate; the flesh thin, yellowish; the dermis furfuraceous-granulose, ochraceous; the veil lacerate and more or less appendiculate. Stipe subequal, slender, fistulous, scaly below the annulus and colored as the pileus. Lamellae rather broad, close, white becoming yellowish, adnate; spores elliptic, $5-7 \times 4$ mic.

Growing on the ground in mountain woods. New York, Peck; Vermont, Morgan. Pileus 2-4 cm. in diameter, the stipe 4-8 cm. long and 2-4 mm. thick.

14. LEPIOTA RUGOSO-RECTICULATA LORINSER, OEST. BOT. ZEITSCHR. 1879.

This species is not described further than the statement that it is related to *L. amianthina*; it differs from it in the surface of the pileus being rugose-reticulate, and in the odor being strong and almost acrid.

Growing in mossy places in woods. New York, Peck.

15. LEPIOTA ADNATIFOLIA PECK, 55 N. Y. REPORT. 1901.

Pileus broadly convex or nearly plane; the flesh thin, white; the dermis minutely granulose or squamulose, varying in color from alutaceous to fulvous; the margin usually appendiculate with the fragments of the veil. Stipe short, thick, solid then stuffed or hollow, glabrous or slightly scaly below the annulus, pallid or rufescent. Lamellae adnate, white; spores $5-6 \times 4-5$ mic.

Growing on the ground under Pine trees. New York, Peck. Pileus 3-6 cm. in diameter, the stipe 2-4 cm. long and 4-8 mm. thick.

16. *LEPIOTA GRANOSA* MORGAN, JOURN. CIN. SOC. N. H. 1883.

Pileus fleshy, ovoid then convex and expanded, subumbonate, more or less irregular and wavy in outline; the flesh thick, whitish or subochraceous, the dermis thick, furfuraceous-granulose, ochraceous to fulvous; the veil of like substance. Stipe tapering upward from a thickened base, fistulous, fibrous-stuffed, whitish or subochraceous above the annulus, below clothed and colored as the pileus. Lamellae rather narrow, close, adnate, tapering outward, whitish or subochraceous; the spores subelliptic, 5×3 mic.

Gregarious or subcaespitose; growing on or near rotten stumps and logs in woods. Cincinnati, O.; New York, *Peck*; W. Virginia, *Lloyd*. Pileus 5-9 cm. in diameter, the stipe 5-10 cm. long and 10-15 mm. thick. This is a rare plant with me; I have not seen it for many years.

b. *Lamellae free from the stipe or merely reaching it.*

17. *LEPIOTA CARCHARIAS* PERSOON. DISP. FUNG. 1797.

Pileus fleshy, ovoid then campanulate and explanate, umbonate; the flesh thin, white; the dermis granulose, whitish, pinkish to flesh-color; the veil of similar substance and continuous downward with the dermis of the stipe. Stipe tapering upward from a thickened base, fistulous, fibrous-stuffed, below the annulus clothed and colored as the pileus. Lamellae rather broad, close, white, tapering inward and reaching the stipe; spores subelliptic, $3-4 \times 2.5-3.0$ mic.

Growing on the ground in woods, Dayton, O. Pileus 3-5 cm. in diameter, the stipe 4-5 cm. long and 4-6 mm. thick. The taste and odor disagreeable according to Persoon.

18. *LEPIOTA GRANULOSA* BATSCH, EL. FUNG. 1783.

Pileus fleshy, ovoid then convex and explanate, subumbonate, often radiately wrinkled; the flesh thin, white, rufescent; the dermis furfuraceous-granulate, ferruginous or fulvous to dark-rufous; the veil similar, lacerate and appendiculate. Stipe more or less elongated, subequal, fistulous, fibrous-stuffed, below the annulus clothed and colored as the pileus. Lamellae rather broad, close, white, rounded behind and slightly adnexed; spores elliptic $4-5 \times 3-4$ mic.

Growing in open woods and waste places. Atlantic coast states, *Schweinitz*, *Curtis*, *Peck*, etc. Pileus 3-5 cm. in diameter, the stipe 3-7 cm. long and 3-5 mm. thick.

19. *LEPIOTA CULTORUM* B. & C., N. A. FUNGI No. 3. 1853.

Pileus hemispheric, umbonate, the border sometimes repand, clothed with very numerous, brown, granular scales. Stipe short, furfuraceous; the annulus nearly central. Lamellae broad, ven-

tricose, free, remote; spores cymbiform, rather acute at either extremity, about 12 mic. in length.

Growing among pumpkins in cultivated lands. S. Carolina, *Curtis*. Pileus 2-3 cm. in diameter, the stipe 2-3 cm. high and 2 mm. thick.

20. *LEPIOTA REPANDA*, *MASTOCEPHALUS REPANDUS* CLEMENTS, BOT. SURVEY NEB. IV. 1896.

Pileus fleshy, convex with a wavy outline, umbonate, the surface covered with minute crowded granular scales, incarnate-ochraceous. Stipe slender, equal, hollow, white above the annulus, below minutely floccose farinaceous and pinkish-ochraceous. Lamellae ventricose, free, white; spores globose or oval, $5-7 \times 5$ mic.

Growing on rich soil, Nebraska, *Clements*. Pileus 1-2 cm. in diameter, the stipe 2-3 cm. long and 1-2 mm. thick.

IV. *CLYPEOLARIAE*. *Dermis of the pileus a thin membrane, radiately fibrillose, the cuticle at first continuous but sooner or later broken up and drawn apart by the growth of the pileus, this at length presenting a white-fibrillose surface sprinkled with colored scales; the veil lacerate, part of it appendiculate, continuous downward with the floccose-fibrillose investment of the stipe.*

Agarics mostly of small size, comprising altogether many species.

21. *LEPIOTA CLYPEOLARIA*, *AGARICUS CLYPEOLARIUS* BULLIARD, HERB. FR. 1788, FRIES. ICONES, SEL. 1867; *LEPIOTA CLYPEOLARIA*, PECK, 54 N. Y. REP. 1900.

Pileus fleshy, ovoid then campanulate and explanate, sub-umbonate; the flesh thin, white; the dermis radiately-fibrillose and white or yellowish beneath the cuticle; the cuticle thin, at first continuous and fulvous or rufous, soon broken up except in the center and drawn apart into small scales; the margin appendiculate by fragments of the veil. Stipe tapering upward from a slightly thickened base, fistulous, fibrous-stuffed, fibrous-floccose below the annulus and white or yellowish. Lamellae rather broad, close, free, white or yellowish; spores oblong or subfusiform; $15-20 \times 5-7$ mic.

Solitary or gregarious; growing in the woods of hilly and mountainous regions. New York, *Peck*. Pileus 3-7 cm. in diameter, the stipe 5-8 cm. long and 3-6 mm. thick. I give the species as figured by Fries and figured and described by the state botanist of New York. I am disposed to think the plant has a limited range, but the name has been widely used and no doubt generally applied to two or three of the following species.

22. *LEPIOTA METULISPORA*, *AGARICUS METULAE-SPORUS* B. & Br., *Fungi of Ceylon*, 1870.

Pileus fleshy, ovoid then campanulate and explanate, subumbonate; the flesh very thin and fragile, white or yellowish; the dermis radiately fibrillose, at length rimulose-sulcate; the cuticle thin, at first continuous, pale ochraceous to fulvous and rufous, soon lacerate into small scales; the veil lacerate; appendiculate. Stipe slender, hollow, fragile, tapering slightly upward, with a white or yellowish, floccose-fibrillose cuticle below the annulus. Lamellae rather narrow, close, free, white or yellowish; spores oblanate, $9-12 \times 3-4$ mic.

Solitary or gregarious; growing among old leaves in woods. Southern U. S. Common about Preston, O. Pileus 2-4 cm. in diameter, the stipe 5-7 cm. long and 3-5 mm. thick. This seems to be a more delicate and fragile plant than *L. clypeolaria*; it is considered a "form" of the Ceylon species; it certainly does not strictly agree with the figures or the descriptions of the Ceylon or English species.

23. *LEPIOTA SPANISTA* MORGAN, SP. NOV.

Pileus fleshy, ovoid then campanulate and expanded, subumbonate; the flesh thin, white; the dermis radiately fibrillose, at first continuous, alutaceous to pale umber, the cuticle at length separating into appressed scales; the veil lacerate, appendiculate. Stipe tapering upward from a thickened base, fistulose, fibrous-stuffed, squamulose below the annulus and colored as the pileus. Lamellae rather broad, close, white, approximate; spores elliptic-oblong, $8-11 \times 5$ mic.

Growing amongst rotten wood in woods. Preston, Ohio. Pileus 3-5 cm. in diameter, the stipe 4-6 cm. in length and 5-8 mm. thick. A plant of firmer texture than *L. metulisporea*. Apparently more closely related to *L. helveola* Bresadola, *Fungi Tridentini*.

24. *LEPIOTA SUBLILACEA* PECK, *BULL. TORR. CLUB.* 1897.

Pileus fleshy, convex, obtuse or umbonate; the flesh thin white; the dermis brownish tinged with lilac, separating into small floccose scales; the veil slight, evanescent. Stipe short, solid, colored as the pileus below the annulus. Lamellae rather broad, subdistant, free, whitish; the spores elliptic, 10×5 mic. uniguttulate.

Growing on bare ground in pastures. Kansas, *Bartholomew*. Pileus 1-2.5 cm. in diameter, the stipe 1-2.5 cm. long and 2-4 mm. thick. This plant appears to have some resemblance to *L. lilacea* Bresadola.

25. *LEPIOTA FLORALIS* B. & Rav., *N. A. FUNGI* No. 4. 1853.

Pileus fleshy, convex then explanate; the flesh very thin, white: the dermis radiately fibrillose and striate around the mar-

gin; the cuticle separated into brownish, floccose scales. Stipe slender, attenuated downwards, brown like the pileus; the annulus persistent about the middle of the stipe. Lamellae broad, distant, ventricose, free; the spores about 10 mic. long.

Gregarious; growing on rich soil in gardens. S. Carolina, *Ravenel*. Pileus 1-2 cm. in diameter, the stipe 2-2.5 cm. in length and not 1 mm. thick. It is desirable that the species be identified and better described.

26. *LEPIOTA UMBROSA* MORGAN, SP. NOV.

Pileus fleshy, ovoid then campanulate and expanded, subumbonate; the flesh thin, white; the dermis radiately fibrillose, white beneath the cuticle, cuticle tawny-brown, darker in the center, at maturity slightly parted into minute scales, the fibers on the umbo often acutely convergent; the veil flocculose, partly appendiculate. Stipe subequal above the mycelial bulb, fistulous, fibrous-stuffed, white and smooth above the annulus, below floccose-fibrillose and rufescent, with scattered tawny scales. Lamellae rather narrow, close, white, rounded behind, free, approximate; spores elliptic-oblong, obliquely apiculate, $5-6 \times 3$ mic.

Growing on the ground in woods, Preston, Ohio. Pileus 1.5-2.5 cm. in diameter, the stipe 4-5 cm. long and 2-4 mm. thick.

27. *LEPIOTA GRACILIS* PECK, BULL. TORR. CLUB. 1900.

Pileus fleshy, ovoid then convex and expanded, subumbonate, the flesh thin, white; the dermis white beneath the brown or blackish cuticle, which is soon broken up and drawn apart into small scales. Stipe long, slender fibrillose-floccose, brown or blackish; the annulus membranaceous, persistent, blackish on the under side. Lamellae close, ventricose, free whitish; the spores broadly elliptical, $6-7 \times 4$ mic.

Growing in rich soil in woods, Canada, *Dearness*. Pileus 6-10 mm. in diameter, the stipe 2-3 cm. long and about 1 mm. thick.

28. *LEPIOTA FELINA* PERSOON, SYNOPSIS 1801; COOKE. ILLUSTRATIONS. Pl. 943.

Pileus fleshy, ovoid then campanulate and explanate, subumbonate; the flesh thin, white; the dermis radiately fibrillose, white beneath the black cuticle; the cuticle at first continuous soon broken up and drawn apart into small scales. Stipe tapering upward from a clavate base, fistulous, the cuticle whitish above, blackened and scaly below; the annulus thin membranaceous, deciduous. Lamellae rather narrow, close, free, white; spores elliptic-ovoid, $6-8 \times 4-5$ mic.

Growing on the ground in woods. New York, *Peck*; Wisconsin, *Denniston*; Preston, O. Pileus 3-5 cm. in diameter; the stipe 5-8 cm. long, 2-3 mm. thick at apex, 3-6 mm. at the base.

V. ASPERAE. *Dermis of the pileus or at least its superficial layer fibrillose-scaly from the first, the scales reflexed and squarrose or the fibres fasciculate and convergent into pointed warts; the veil and the cuticle of the stipe may be of similar texture or the stipe may be nearly glabrous.*

A tribe of many species among which are some of rather large size.

29. *LEPIOTA ASPERA*, *AMANITA ASPERA* PERSOON, SYNOPSIS, 1801. *AGARICUS ACUTESQUAMOSUS* Weinman, Sylloge I. 70. Stevenson, Br. Fungi I. 16. Cooke Illust. Pl. 14.

Pileus fleshy, hemispherical, then expanded and convex, obtuse; the flesh moderately thick, white; the dermis appressedly tomentose, pale ferruginous, sprinkled with minute, sharp-pointed, brownish, easily separating warts; veil large, membranaceous, persistent, adherent in places to the margin of the pileus and annulate upon the stipe. Stipe tapering upward from a bulbous base, thick, fistulous, fibrous-stuffed, white above the annulus, below fibrillose-scaly and ferruginous. Lamellae rather narrow, closely crowded, white, tapering inward, free, approximate; spores 6-10 x 2-3 mic.

Pileus 10-15 cm. in diameter; the stipe 8-12 cm. in length, 8-12 mm. thick at the apex, 18-25 mm. at the bulbous base. This plant and *Lepiota Friesii* are considered by Fries to be varieties of a single species. In Europe they grow in grassy grounds and gardens. In this country the plants reported under the name *Lepiota acutesquamosa* undoubtedly belong to several different species.

30 *LEPIOTA ASPRATA* Berkeley. HOOKER'S JOURNAL, 1847. *LEPIOTA ECHINODERMATA* CKE. & MASS. GREVILLEA XVI. 30.

Pileus fleshy, convex then explanate; the flesh thin, white, the dermis a dense fibrillose-floccose layer, the fibers convergent into erect, conic warts, pale yellow to orange in color, the veil lacerate, appendiculate. Stipe slender, nearly equal, floccose-scaly below the annulus and colored as the pileus. Lamellae close, ventricose, white, slightly adnexed; spores sub-elliptic 8-10 x 6 mic.

Growing on the ground and on rotten wood. S. Carolina, Curtis; Alabama, Atkinson. Pileus 2-4 cm. in diameter, the stipe 4-5 cm. long and 3-4 mm. thick. Fries in the *Novae Symbolae* and also in the *Hym. Eur.* identifies this species with *Pholiota muricata* Fr.

31. *LEPIOTA HEMISCLERA* B. & C. FUNGI CUB. 1867.

Pileus fleshy, ovoid then convex and explanate; the flesh thin, white; the dermis a dense fibrous coat, alutaceous to umber, the ends of the fibers curling up and convergent into small pointed warts; the veil ample, irregularly lacerate, continuous downward with the fibrillose cuticle of the stipe. Stipe fistulous,

fibrous-stuffed, white above the irregular annulus, below white-fibrillose, with or without some colored scales, arising from a bulbous base; the bulb depressed and marginate. Lamellae narrow, closely crowded, white, some of them forked, obtuse behind and tapering outward, free; spores obtuse or truncate at one end, pointed at the other, $5-8 \times 3$ mic.

Growing about old stumps and the base of trees in woods. Cuba. *Wright*; Preston, O. Pileus 5-9 cm. in diameter, the stipe 5-10 cm. long and 6-10 mm. thick above the marginate bulb.

32. *LEPIOTA ASPERULA* ATKINSON, MUSHROOMS. 1901. *LEPIOTA ERIOPHORA* PECK. BULL. TORR. CLUB. 1903.

Pileus fleshy, convex then expanded and explanate; the flesh thin, white; the dermis a thick fibrous coat, alutaceous to umber, at first densely scaly, the scales at length erected into pointed warts; the veil lacerate: appendiculate. Stipe subequal above the bulbous base, fistulous, fibrous-stuffed, below the annulus floccose-fibrillose and colored as the pileus. Lamellae rather narrow, white, tapering inward, free; spores oblong, obliquely apiculate, $3-5 \times 2-3$ mic.

Growing in rich soil in woods. New York, *Atkinson*; W. Virginia, *Lloyd*; Preston, O. Pileus 3-5 cm. in diameter, the stipe 4-6 cm. long and 3-5 mm. thick. The bulb at the base seems larger on account of the adherent soil and mycelium. I have heretofore called this species *Lepiota hispidula* Lasch.

33. *LEPIOTA FUSCOSQUAMEA* PECK, 26 N. Y. REPORT 1873 AND 35 N. Y. REPORT.

Pileus fleshy, hemispherical or convex subumbonate; the flesh thin, white; the dermis consisting of numerous, substribose, erect or reflexed, blackish-brown scales; the veil slight, evanescent. Stipe short, equal above the bulbous base, fistulous, fibrous-stuffed, floccose-fibrillose and colored as the pileus. Lamellae close, free, white; the spores elliptic-oblong, $6-8 \times 3-4$ mic.

Growing in Pine and Hemlock woods. New York, *Peck*. Pileus 4-6 cm. in diameter, the stipe 5-7 cm. long and 6-8 mm. thick. A rare plant!

34. *LEPIOTA ACERINA* PECK. 51 N. Y. REP. 1897.

Pileus subglobose, then convex and expanded; the flesh thin, white; the dermis at first a thin, dense, fibrous coat, tawny, darker in the center, separating at length into fibrillose scales; the veil lacerate appendiculate. Stipe short fibrous-stuffed, fibrillose-scaly, rufescent, the base bulbous. Lamellae rather broad, white, obtuse behind, approximate; spores pointed at one end, obtuse or truncate at the other, $8-10 \times 3-4$ mic.

Growing on rotten wood in woods. New York, *Peck*, Preston, O. Pileus 1.5-2.5 cm. in diameter, the stipe 2-4 cm. long and 2-4 mm. thick. Apparently much resembling *L. Boudieri* Bres., especially as to the spores.

35. *LEPIOTA GEMMATA* MORGAN, SP. NOV.

Pileus fleshy, at first globose then convex and expanded; the flesh thick, white; the dermis rather thick, white, its surface from the first divided up into minute, erect, pointed warts, which grow dusky with age; the veil appendiculate. Stipe tapering upward, fistulous, fibrous-stuffed, white, flocculose-scaly up to the annulus, the scales becoming dusky. Lamellae broad, close white, inwardly obtuse and approximate; spores oblong, obliquely apiculate, $4.6 \times 2.5-3.0$ mic.

Growing in rich soil or rotten wood. Preston, O. Pileus 2-4 cm. in diameter, the stipe 3-5 cm. long, and 3-5 mm. thick. Before the expansion of the pileus it looks like a young *Lycoperdon gemmatum*. After maturity the superficial pointed warts sometimes disappear leaving the surface pulverulent.

VI. *GLIODERMATA*. *Dermis of the pileus continuous, never separating into scales, but the surface invested by a more or less thickened layer of gluten, pellucid or colored. Stipe commonly dry and squamulose or subglabrous, in a few species with a viscid cuticle like the pileus.*

36. *LEPIOTA CANDIDA* MORGAN SP. NOV.

Pileus fleshy, ovoid then convex and explanate, subumbonate; the flesh thin, white; the dermis radiately fibrillose, smooth, pure white, covered by a very thin viscous epidermal layer, at first continuous, but with the growth of the pileus drawn apart and left as minute scales upon the surface. Stipe long, tapering upward from a clavate base, fistulous, silky-fibrillose or quite smooth, pure white; the annulus thin, membranaceous, persistent. Lamellae narrow, close, free and rather remote, pure white; spores elliptic-oblong, obliquely apiculate, 5.7×3.4 mic.

Growing on the ground among old leaves in woods. Preston, O. Pileus 1-3 cm. in diameter; the stipe 5-7 cm. long, 5-6 mm. thick at the base, tapering to 2-3 mm. at the apex. The surface of the pileus sticks to the fingers and to the paper in which it is folded.

37. *LEPIOTA DELICATA* FRIES. SYST. MYC. I, 1821. ICONES SEL. TAB. 15. COOKE, ILLUST. PL. 118.

Pileus fleshy, globose, then convex and explanate; the flesh thin white; the dermis smooth and glabrous, yellowish or rufescent, furnished with a viscid cuticle. Stipe tapering slightly upward, fistulous, fibrous-stuffed, white above the annulus, below densely floccose and colored as the pileus, the annulus membranaceous. Lamellae broad, close, white, free, approximate, spores ———.

Growing on the ground in woods. N. Carolina, *Schweinitz*. Pileus 2-3 cm. in diameter, the stipe 2-3 cm. high and 3-5 mm. thick.

38. *LEPIOTA OBLITA* PECK. 26 N. Y. REP. 1873 AND 35 N. Y. REP.

Pileus fleshy, convex and expanded, subumbonate; smooth or obscurely spotted or scaly, viscid, alutaceous inclining to tawny, the umbo generally darker. Stipe equal or slightly tapering upward, smooth at the top, floccose and viscid elsewhere, fistulous, fibrous-stuffed. Lamellae crowded, free, whitish or yellowish, some of them forked; spores elliptic 5-6 x 3-4 mic.

Growing in frondose woods. New York, *Peck*. Pileus 5-7 cm. in diameter, the stipe 5-7 cm. long and about 6 mm. thick.

39. *LEPIOTA GLISCHRA* MORGAN SP. NOV. *AGARICUS OBLITUS* MORGAN, MYC. FLORA M. V.

Pileus fleshy, subovoid then convex and expanded; the flesh rather thin, white; the epidermis a thin layer of brown gluten, thickest at the center rendering it darker colored; this glutinous layer continuous with the marginal veil and running down and enveloping the stipe. Stipe tapering upward, solid, whitish-fibrillose beneath the brown gluten. Lamellae broad, close, white, rounded behind, free, approximate; spores globose or ovoid, apiculate, 4-5 x 4 mic.

Growing in rich soil in woods. Preston, O. Pileus 3-4 cm. in diameter, the stipe 4-6 cm. long and 3-4 mm. thick.

40. *LEPIOTA FULVODISCA* PECK. BULL. TORR. CLUB. 1895.

Pileus thin, convex or nearly plane, obtuse or umbonate, viscid, white, the umbo fulvous. Stipe slender, flexuous, viscid, hollow, white or whitish, abruptly bulbous at the base; the annulus thin, membranaceous, white. Lamellae narrow, close, free, white; spores elliptic-ovoid, 8-10 x 4-5 mic. uniguttulate.

Growing on the ground among old leaves in woods. California, *M. Clatchie*. Pileus 2-4 cm. in diameter, the stipe 5-8 cm. long and 2-3 mm. thick.

41. *LEPIOTA ILLINITA* FRIES. OBS. MYC. II. 1818. ICONES SEL. TAB. 16.

Pileus fleshy, ovoid then campanulate and expanded subumbonate; the white pileus invested by a thick glutinous layer, pellucid or scarcely colored, which is at first continuous downward upon the stipe. Stipe slender, equal, fistulous, fibrous-stuffed, white beneath the glutinous cuticle. Lamellae broad, close, free, white; spores broadly elliptic, 5-6 x 4 mic.

Growing on the ground in grassy woods and fields. New York, *Peck*; Vermont, *Morgan*; Pacific Coast. Pileus 4-7 cm. in diameter, the stipe 5-8 cm. long and 4-6 mm. thick.

(To be continued.)

SOME WOOD STAINING FUNGI FROM VARIOUS LOCALITIES IN THE UNITED STATES.¹

GEO. G. HEDGCOCK.

(Condensed from the original notes and from descriptions of the cultural characters in the report of the Missouri Botanical Garden.*)

The following species of fungi are described from artificial cultures grown under similar conditions, on similar agar media, and in most cases compared with measurements made from natural growths on wood or other substances.

Ceratostomella in all the species studied has at first a hyaline conidial stage of short duration which soon changes in color and develops dark colored, beaked perithecia, with hyaline ascospores borne in fugacious asci.

Graphium in artificial cultures has two quite distinct conidial stages; the first form of conidia is borne on simple, hyaline, erect hyphae, and disappears later, as the stalks or stromatal outgrowths bearing the heads with the second form are developed. The conidia of the first form, on account of their temporary nature, are called secondary conidia, and those borne in the mucilaginous heads primary conidia, because they are considered the most important conidial stage.

I. CERATOSTOMELLA PILIFERA (Fr.) Wint., Kryptogamenfl. 2:252, *Sphaeria pilifera* Fr. Syst. Myc. 2:472, *Sphaeria rosstrata* Schum. Enum. Fl. Saell. p. 128, *Cerostoma piliferum* Fuckl. Symb. p. 128. Emended, Hedgcock, Mo. Bot. Gard. Rept. 17:64-67, pl. 4, fig. 5-7. Colonies white in conidial stage, changing to gray or brown, with the formation of perithecia; filaments, 3μ to 4μ , hyaline to brown or black; conidia, 8μ to 12μ by 2μ to 4μ , hyaline elliptical to cylindrical, borne terminally in whorls of short, branching chains from upright, hyaline hyphae; perithecia, usually superficial, carbonaceous, globose to pyriform, smooth or sparsely hirsute below, 50μ to 200μ in diameter, with a long, slender beak, 600μ to 1.050μ by 20μ , terminated by a ring of hyaline bristles, 20μ by 2μ average; asci, fugacious, hyaline, pyriform to ovate, 10μ to 15μ by 8μ to 10μ ; ascospores, 8, biseriate, hyaline, elliptical, often curved slightly, 5.5μ to 2.5μ average, exuded in a mucous mass.

On the wood of *Pinus ponderosa* Laws, staining it a blue-black color. Collector, H. von Schrenk, Sheridan, Wyoming, January, 1903.

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* Hedgcock, G. G. Studies upon some chromogenic fungi which discolor wood. Mo. Bot. Gar. Rep. 17: 59-114. Pl. 4-12; 1906, issued as a separate, Sep. 27, 1906.

2. *CERATOSTOMELLA SCHRENKIANA* Hedgcock. Mo. Bot. Gard. Rept. 17:67-69, pl. 4, fig. 1-4. Colonies with conidia white, changing to gray with the formation of perithecia; filaments hyaline to brown, 3μ to 7μ ; conidia, hyaline, often guttulate when old, elliptical to cylindrical, 3μ to 7μ by 1μ to 2μ , borne terminally on upright hyphae in short, branching chains; perithecia, globose, 120μ to 200μ , black, carbonaceous, often slightly hirsute below, or with numerous globular outgrowths, with a beak 8 mm. to 1.2 mm. by 10μ to 25μ , surmounted at maturity with a ring of short, hyaline, spreading bristles, 10μ to 15μ by 2μ ; asci, fugacious, ovate to pyriform; ascospores, hyaline, elliptical, often slightly curved, 2.5μ to 4μ by 1μ to 1.5μ .

On the wood of *Pinus echinata* Mill., staining it a blue-black color. Collector H. von Schrenk, Grandin, Mo., July, 1905.

3. *CERATOSTOMELLA ECHINELLA* E. & E. N. A. Pyr. 195 (1892). Emended, Hedgcock, Mo. Bot. Gard. Rept. 17:69-71, pl. 6, fig. 1. Colonies with conidia, white, changing to brown with perithecia; hyphae, hyaline to brown, 4μ to 7μ in diam.; conidia obovate to elliptical, 4μ to 6.5μ by 2μ to 3.5μ , borne in whorls of short, branching chains, from upright, hyaline hyphae; perithecia, globose or slightly flattened, 50μ to 100μ , glandular-pubescent, membranaceo-carbonaceous, with a long, slightly curved, striate beak, 1 mm. to 1.7 mm. by 15μ to 25μ , terminated with a ring of hyaline bristles, averaging 15μ to 25μ by 1.5μ to 2μ ; glandular hairs on perithecium 10μ to 32μ in length, tapering from 1.5μ to 2.1μ in diam., with glandular, globose tip, 2μ to 3μ in diam.; asci, elliptical to clavate; ascospores, hyaline, cylindrical or slightly curved, biseriate, 4μ to 6μ by 1.2μ to 1.6μ , cream colored in mass.

On wood of *Fagus atropunicea* (Marsh.) Sud., staining it blue or brown. Collector H. von Schrenk, Kirbyville, Texas, July, 1906.

4. *CERATOSTOMELLA CAPILLIFERA* Hedgcock. Mo. Bot. Gard. Rept. 17:71, 72, pl. 6, fig. 2, 3. Colonies with conidia white, changing to gray or brown, with perithecia; filaments, hyaline to brown 2μ to 6μ in diam.; conidia, hyaline, elliptical to cylindrical, 4μ to 8μ by 1.5μ to 2μ , borne in short branching chains, terminal from upright hyphae; perithecia, globose, often flattened, black, carbonaceous, slightly hirsute below, 90μ to 200μ , with a long, slender beak, 1.5 mm. by 25μ , terminated in a ring of long slender, hyaline filaments, 80μ by 1μ ; asci, fugacious, obovate; ascospores, 8, elliptic to reniform, 4.5μ to 1.5μ average.

On the wood of *Liquidambar styraciflua* L., staining it black. Collector H. von Schrenk, Marianna, Arkansas, July, 1905.

5. *CERATOSTOMELLA PLURIANNULATA* Hedgcock. Mo. Bot. Gard. Rept. 17:72-74, pl. 5, fig. 2. Colonies with conidia white,

changing to black with perithecia; filaments hyaline to brown; conidia, hyaline elliptical or obovate, 5μ to 8μ by 2μ to 3μ , borne terminally on erect hyphae in short, branching chains finally falling together in clusters; perithecia globose 90μ to 120μ in diam. black, carbonaceous, slightly hirsute below, with a smooth beak, .9 mm. to 2.1 mm. by 10μ to 30μ , adorned by one or more rings of short, spiny bristles, one of which is terminal; asci, obovate; ascospores, hyaline, reniform to elliptical, 4μ to 5μ by 1.5μ to 1.7μ .

On the wood of *Quercus rubra* L., discoloring it. Collector P. Spaulding, southern Indiana, August, 1905.

6. CERATOSTOMELLA MINOR Hedgcock. Mo. Bot. Gard. Rept. 17:74-76, pl. 5, fig. 6, 7. Colonies with conidia, white, changing to black with perithecia; filaments, hyaline to dark brown, 1.5μ to 4μ in diam., often coarsely rugose in wood cells; conidia, hyaline, 4μ to 5.5μ by 1.8μ to 2μ average, oval to elliptical, borne terminally on upright hyphae in short, branching chains; perithecia solitary, numerous, spherical, black, carbonaceous, rugose, sparsely hirsute at the base, 40μ to 70μ in diam.; with a beak 120μ to 160μ by 6μ to 12μ surmounted at maturity by a ring of thick hyaline bristles; asci, fugacious, round to oval or pyriform; ascospores, 8, hyaline, 3.1μ to 4.2μ by $.9\mu$ to 1.9μ , usually in four.

On the wood of *Pinus arizonica* Eng., staining it blueish-black. Collector J. L. Webb, Flagstaff, Arizona, July, 1904.

7. CERATOSTOMELLA EXIGUA Hedgcock. Mo. Bot. Gard. Rept. 17:76-78, pl. 6, fig. 4-7. Colonies with conidia white, changing to intense black with perithecia; filaments, hyaline to dark brown, often finely rugose in wood, 2μ to 6μ in diameter, conidia 3.5μ to 4.5μ by 1.6μ to 2.2μ , oval to elliptical, borne terminally on upright hyphae in short, branching chains falling together in rounded masses; perithecia, often gregarious, usually superficial, sparsely hirsute at base, black, carbonaceous, rugose, globose, 60μ to 80μ in diameter with a beak 150μ to 200μ by 8μ to 18μ , terminating in a ring of slender hyaline bristles; asci, fugacious, hyaline, pyriform to elliptical; ascospores, 8, often in fours, hyaline, elliptical to reniform, 2.1μ to 2.8μ by 0.8μ to 1.1μ .

On wood of *Pinus virginiana* Mill., staining it dark blue or black. Collector A. D. Hopkins, Kanawha, W. Va., Sept., 1904.

8. CERATOSTOMELLA MONILIFORMIS Hedgcock. Mo. Bot. Gard. Rept. 17:78-80, pl. 5, fig. 3-5. Colonies with conidia, gray, changing to black, with the formation of perithecia; filaments, hyaline, 2μ to 8μ in diam., often granular, later brown or black; conidia, hyaline, 6μ to 8μ by 1.8μ to 2.2μ , elliptical to cylindrical, moniliform, collecting in masses, borne on simple or branching erect hyphae; perithecia brown or black, often membranaceous,

globose, 90μ to 180μ in diam., covered sparsely with conical spines, 12μ to 20μ in length by 1μ at the apex, and 6μ at the base; the beak is brown or black, .6 mm. to 1 mm. by 10μ to 30μ , striate, surmounted by thick, hyaline bristles, 12μ to 18μ by 2μ ; asci, oval, 20μ by 10μ , fugacious; ascospores, 8, hyaline gray in mass, oval to elliptical often flattened on one side, 4μ to 5μ by 3μ to 4μ .

On the wood of *Liquidambar styraciflua* L., staining it brown. Collector H. von Schrenk, Kirbyville, Texas, July, 1906.

9. *GRAPHIUM EUMORPHUM* Sacc., Syll. Fung. 4:611, *Sporocybe eumorpha* Sacc. Fung. It. n. 942. (1881). Emended, Bou langer, Rev. Gén. de Bot. 7:97-102, 166-170. (1895)., pl. 2-5. Hedgcock, Mo. Bot. Gard. Rept. 17:87-88, pl. 7, fig. 1-5. Colonies white or gray, changing to light, or even dark green in the stromata; hyphae, 1μ to 2μ in diameter, hyaline to light green; secondary conidia, 7.8μ by 3.4μ , hyaline, often greenish yellow, borne singly or in whorled clusters on upright hyphae; primary conidia, 7.7μ by 3.4μ , hyaline, tinged with green, borne terminally on alternately branched hyphae in mucoid, stromatal heads; heads, spherical with mucous sheath, oval without, 30μ to 100μ in diameter, gray to iridescent green; stalks, simple or gregarious, dark to light green, or even yellow green, 300μ to 500μ in length, 10μ to 40μ in diameter; *Anthina*-like forms present.

On wood of *Rubus strigosus* L., staining it a dirty color. Missouri Botanical Garden, June, 1905. G. G. Hedgcock, collector.

10. *GRAPHIUM ATROVIRENS* Hedgcock, Mo. Bot. Gard. Rept. 17:88-90, pl. 8, fig. 1-3. Colonies white, changing to dark green in the stromata; filaments, 3μ to 4μ , hyaline, changing to gray, green or olive; secondary conidia, 4μ to 5.5μ by 1.6μ to 2μ , hyaline, obovate to elliptical, guttulate when old, borne on simple hyphae in short, branching moniliform chains, finally adhering in masses; primary conidia, 3.5μ to 4.5μ by 1.4μ to 2μ , hyaline, obovate to elliptical, borne in flattened, oval, white to gray heads, which with mucous sheath measure 40μ to 600μ in diameter; stromatal stalks, usually solitary, slender hyaline to dark green, 1.5mm to 3mm. by 8μ to 80μ , base often slightly enlarged; tall, sterile, *Anthina*-like stalks often form.

On the wood of *Liquidambar styraciflua* L., Marianna, Ark., staining it black. Collected by H. von Schrenk, July, 1905.

11. *GRAPHIUM SMARAGDINUM* (A. & S.) Sacc. Syll. Fung. 4:618. Emended, Hedgcock, Mo. Bot. Garden Rep. 17:91, 92, pl. 9, fig. 8-10. Colonies white to gray-green or olive in stromata; filaments hyaline to dark green, 2μ to 4μ in diameter; secondary conidia 3.6μ by 1.8μ , hyaline, elliptical, borne continuously from the ends of simple or branched upright hyphae, collecting in mucoid masses; primary conidia, 3.2μ to 4.2μ by 1.7μ

to 2μ , hyaline, elliptical, borne from the ends of alternately branched hyphae in the stromatal heads; heads with mucous sheath, spherical, 40μ to 600μ , without sheath, fungiform, often with the edges recurved; stalks simple and gregarious, 1mm. to 2mm. by 8μ to 90μ , often enlarged in the center, sterile *Anthina*-like outgrowths of the stroma often present.

On the wood of *Liquidambar styraciflua* L., Marianna, Ark., staining it black. Collected by H. von Schrenk, July, 1905.

12. *GRAPHIUM RIGIDUM* (Pers.) Sacc. Syll. Fung. 4:610, *Stilbum rigidum* Pers. Uster Annal. 1:32. Emended, Hedgcock, Mo. Bot. Gard. Rept. 17:92-94, pl. 7, fig. 6-10. Colonies white, changing to brown or black in stromata; hyphae, 2μ to 4μ in diam., hyaline to gray or olive; secondary conidia, 3μ to 4.5μ by 1μ to 1.5μ , hyaline, elliptical, borne continuously and terminally from erect simple or branched hyphae, falling at once into mucoid masses; primary conidia, 3.5μ to 1.5μ , elliptical to cylindrical, hyaline, borne on alternately branched hyphae in stromatal heads; heads spherical, with mucous sheath, 20μ to 500μ in diam., white to a dingy yellow; stalks, 1 mm. to 2mm. by 10μ to 40μ , gray to brown or black, solitary or gregarious, rigid, not expanded.

On the sapwood of *Quercus rubra* L., staining the wood brown. Collector, P. Spaulding, Indiana, Sept., 1905.

13. *GRAPHIUM AUREUM* Hedgcock, Mo. Bot. Gard. Rept. 17:94-96, pl. 9, fig. 5-7. Colonies white, changing to pale yellow or light brown in the stromata; filaments, 2μ to 3μ , hyaline to light brown; secondary conidia, 4μ to 8μ by 1μ to 2μ , obovate to clavate, hyaline, guttulate when old, borne in short, branching moniliform chains or in clusters of simple conidia; primary conidia, 4μ to 5μ by 1μ to 2μ , hyaline, obovate, borne terminally on filaments of the flattened, oval head; head with mucous white to yellow, spherical, 15μ to 240μ in diameter; stromatal stalks, simple or gregarious, 50μ to 750μ by 10μ to 90μ ; sterile, *Anthina*-like stalks are often present.

On sapwood of *Pinus strobus* L., Ashland, Wisconsin, staining it a dirty color. Collected by H. von Schrenk, April, 1905.

14. *GRAPHIUM ALBUM* (Corda) Sacc. Syll. Fung. 4:618, *Ceratopodium album* Corda Ic. Fung. 1:20. Emended, Hedgcock, Mo. Bot. Gard. Rept. 17:96-97, pl. 9, fig. 1-4. Colonies white, changing to light yellow or orange in the stromata; filaments hyaline to yellow or light brown, 2μ to 3μ in diameter; secondary conidia, 4μ to 6μ by 1μ to 2μ , hyaline, obovate to clavate, guttulate when old, borne in short, branching moniliform chains terminally from erect hyphae; primary conidia 3μ to 5μ by 1μ to 1.5μ , hyaline, obovate, borne terminally on the filaments of the stromatal heads; heads white to creamy yellow, or even a light brown when old and dry, spherical with mucous, 20μ to 600μ in diameter, without mucous a flattened oval to fungi-

form, stalks .3mm. to 2mm. by 30μ to 300μ , varying from yellow to dark brown at the base; *Anthina*-like, stromatal forms present.

Found on sapwood of *Fagus atropunicea* (Marsh.) Sud., staining it brown. Collected by P. Spaulding, Arkansas, Sept., 1905.

15. *GRAPHIUM AMBROSIIGERUM* Hedgcock, Mo. Bot. Gard. Rept. 17:85-86, pl. 8, fig. 4-7. Colonies white, changing to brown in stromata; filaments 1.5μ to 2.5μ , hyaline to brown; secondary conidia 3.7μ by 1.3μ , hyaline, oval to elliptical, borne in whorled clusters of simple conidia on upright hyphae; primary conidia 5μ by 3μ , borne on filaments in stromatal heads; heads oval without mucous sheath, white to dark brown, with sheath, spherical, 30μ to 300μ ; stalks black or brown, 500μ to 900μ by 10μ to 40μ , simple or gregarious.

On the sapwood of *Pinus arizonica* Eng. in beetle holes staining it black. Collected by J. L. Webb, Flagstaff, Arizona, July, 1904.

16. *FUSARIUM ROSEUM* Link Sp. Pl. Fungi 2:105. *Fusidium roseum* Link Obs. 2:31. Colonies white, changing to pink, red, or lilac; microconidia one- to two-celled, hyaline, oval to elliptical, 8μ to 14μ by 3μ to 6μ , often uninucleate; macroconidia, 19μ to 30μ by 3.5μ to 6μ , straight or slightly curved, fusiform, two- to four-celled; chlamydospores, spherical, or slightly flattened, granular, yellow to dark brown, 10μ to 14μ in diameter; dark green or brown sclerotia present in cultures on boiled potato; staining pine sapwood pink to lilac.

On the sapwood of *Pinus strobus* L., Ashland, Wisconsin. Collected by H. von Schrenk, April, 1905.

Saccardo gives several varieties of *Fusarium roseum*, most of which differ greatly in the size of the microconidia. Those of our fungus are smaller than most of the measurements given by Saccardo, making it a little doubtful if the species is *F. roseum*.

17. *HORMODENDRON CLADOSPORIOIDES* (Fres.) Sacc. Mich. 2:148. *Penicillium cladosporioides* Fres. Beitr. 3:22. Colonies, gray or greenish yellow, changing to velvety brown or black; filaments, gray to olive, 2μ to 8μ ; sporophores, 100μ to 400μ by 3μ to 4μ , with branches one to three-septate, measuring 6μ to 15μ by 3μ to 5μ ; conidia, 3μ to 7μ by 2μ to 4μ , usually unicellular, oval, olive, or brown, in short, branched chains of two to six, staining sapwood black.

On the sapwood of pine, elm, gum and oak, Missouri and Arkansas. Collected by H. von Schrenk and Geo. G. Hedgcock.

18. *HORMODENDRON GRISEUM* Hedgcock, Mo. Bot. Gard. Rept. 17:100, 101, pl. 10, fig. 2. Colonies gray, changing to dingy black, furry; filaments, granular, hyaline to gray or black, 3μ to 10μ in diameter; sporophores, 20μ to 800μ by

3μ to 4μ , with branches one to three-septate, measuring 6μ to 14μ by 3μ to 4μ ; conidia 3μ to 6μ by 2μ to 4μ , usually unicellular, pointed oval, gray to sooty, borne in short, branched chains of 2 to 10; staining sapwood black.

On the wood of *Liquidambar styraciflua* L., from various points in Arkansas. Collected by H. von Schrenk, July, 1905.

19. *HORMISCIMUM GELATINOSUM* Hedgcock, Mo. Bot. Gard. Rept. 17:101-103, pl. 11, fig. 4-8. Colonies yeast-like at first, creamy, changing to brown or black, finally becoming fimbriate or toruloid; filaments, often toruloid or beaded, cylindrical cells 5μ to 10μ in diameter, and spherical cells 2μ to 8μ ; conidia borne both on prostrate and upright hyphae, dimorphous, the form on prostrate hyphae is of two types, the one hyaline, elliptical, thin-walled, fugacious, 8μ to 12μ by 3μ to 5μ , the other brown, elliptical, thick-walled, 10μ to 14μ ; the form on short, upright hyphae, globose dark olive, 7μ to 12μ in diameter, borne in chains which do not break apart readily; staining sapwood black.

On the sapwood of pine, elm and gum, from various points in Arkansas and Missouri, collected by H. von Schrenk and Geo. G. Hedgcock, 1905.

20. *PENICILLIUM AUREUM* Corda, Prachtfl. 18:38. Sacc. Syll. Fung. 4:82. Emended, Hedgcock, Mo. Bot. Gard. Rept. 17:105-107, pl. 11, fig. 1-3. Colonies, gray, or sometimes blue green, changing to lemon yellow, or orange red; mycelium, dimorphous, filaments, 3μ to 8μ in diameter, cells sometimes swollen or beaded; sterile hyphae, curled and distorted, lemon yellow on acid media, orange red on alkaline, bearing exuded granules of a soluble pigment which is yellow with acid, and red with alkali; fertile hyphae, erect, 100μ to 500μ by 3μ , often with two sets of whorled branches, each branch averaging 12μ by 2μ ; conidia blue green, pointed oval 3μ to 4μ by 1.5μ to 2μ , borne in simple chains of 40 to 80, containing a soluble blue green pigment, not changed in color by acids or alkalis; staining pine sapwood yellow or red. *Coremium* forms often present on rich agar media.

On the sapwood of *Pinus strobus* L., Ashland, Wisconsin, collected by H. von Schrenk, April, 1905.

NOTES FROM MYCOLOGICAL LITERATURE. XXI.

W. A. KELLERMAN.

Durand, Elias J.

ELIAS J. DURAND GIVES IN THE JAN. NO. OF THE JOURNAL OF MYCOLOGY (1906) his conclusions from an extended study of *Peziza fusicarpa* Ger. and *Peziza semitosta* B. & C. He says these observations are based on about 50 separate collections, besides numerous ungathered plants in the field. He says: "My conclusions based upon a study of the material indicated may be stated briefly as follows: *Peziza fusicarpa* Ger. (1873), *P. pubida* B. & C. (1875), and *P. morgani* Mass. (1902) are specifically identical and synonymous; *P. semitosta* B. & C., while closely allied to *P. pubida* B. & C., is not identical with it, but is specifically distinct; *P. hainesii* Ell. (1881) is identical with *P. semitosta* B. & C. (1875), as recently stated by Ellis himself. (Jour. Mycol. 10:170.)"

Kellerman, W. A.

NOTES FROM MYCOLOGICAL LITERATURE XIII-XVII, were given by W. A. Kellerman, in 1905, in the January, March, May, July and November Nos. of the Journal of Mycology. The gist of each article noted is stated in a single short paragraph, and every mycological paper published in this country, and the important ones in foreign journals, are included.

Kellerman, W. A.

UREDINOUS CULTURE EXPERIMENTS WITH PUCCINIA SORGHI, 1905, W. A. Kellerman, Journal of Mycology, Jan. 1906, notes experiments in April and May 1905, using teleutospores from sweet corn and obtaining *Aecidia* on *Oxalis*. An outline of previous work with this Rust is given, — inoculation of the maize plant with material from teleutosporic pustules then was probably due to the fact that a few uredospores viable were harbored by these sori. "Doubtless then the Rust of Maize is carried over from year to year in part by means of surviving uredospores."

Missouri Botanical Garden, 16th Annual Report, 1905.

THE SIXTEENTH ANNUAL REPORT OF THE MISSOURI BOTANICAL GARDEN (1905) contains the following mycological articles: Perley Spaulding, A Disease of Black Oaks caused by *Polyporus obtusus*; Herman von Schrenck, On the Occurrence of *Peronospora parasitica* on Cauliflower; George Grant Hedgcock, A Disease of Cauliflower and Cabbage caused by *Sclerotinia*; George Grant Hedgcock, A Disease of Cultivated Agaves due to *Colletotrichum*.

Missouri Botanical Garden, 15th Annual Report, 1904.

TWO MYCOLOGICAL ARTICLES APPEARED IN THE 15TH ANNUAL REPORT of the Missouri Botanical Garden, 1904, namely: Perley Spaulding, Two fungi growing in holes made by wood-boring insects; and Wm. Trelease, Aberrant veil Remnants in some Edible Fungi.

Missouri Botanical Garden, earlier Reports.

IN EARLIER VOLUMES OF THE REPORTS OF THE MISSOURI BOTANICAL GARDEN mycological articles appeared as follows [12th Report, 1901] Hermann von Schrenk, A Disease of the Black Locust (*Robinia Pseudacacia* L.); [11th Report, 1900] Hermann von Schrenk, A Disease of *Taxodium distichum* known as Peckiness, also a similar disease of *Libocedrus decurrens* known as Pinrot; [10th Report, 1899] Hermann von Schrenk, A sclerotoid Disease of Beech Roots; [9th Report] Wm. Trelease, A new Disease of Cultivated Palms.

Arthur, J. C.

J. C. ARTHUR'S CULTURES OF UREDINEAE IN 1904, see Journal of Mycology, March 1905, involved 264 sowings of spores representing 40 species of rusts for which purpose were required 119 species of hosts temporarily grown in pots in the greenhouse. A new description of *Melampsora bigelowii* Thüm. is furnished — this rust occurring on *Salix amygdaloides* Anderss. and many other species of *Salix* throughout the United States and Canada. A description of *Aecidium clematidis* Schw. is given, also of *Puccinia stipae* Arth., for which heretofore the aecidium had not been characterized (on *Aster multiflorus* Ait., *A. ericoides* L. & *A. novae-angliae* L.). The summary gives a list of the successful cultures, 16 species previously reported and 5 reported now for the first time. The latter are quoted: "1. *Melampsora bigelowii* Thuen. — Teleutospores on *Salix amygdaloides* Anders. sown on *Larix decidua* Mill.; 2. *Puccinia tomipara* Trel. — Teleutospores on *Bromus ciliatus* L. sown on *Clematis Virginiana* L.; 3. *Puccinia stipae* Arth. — Teleutospores on *Stipa spartea* Trin. sown on *Aster multiflorus* Ait., *A. ericoides* L., and *A. Novae-Angliae* L.; 4. *Puccinia sorghi* Schw. — Aecidiospores on *Oxalis cymosa* Small sown on *Zea Mays* L.; 5. *Puccinia podophylli* Schw. — Aecidiospores on *Podophyllum peltatum* L. sown on same host."

Kellerman, W. A. and Ricker, P. L.

THE FIRST SUPPLEMENT TO NEW GENERA OF FUNGI Published Since the Year 1900, with Citation and Original Descriptions, compiled by W. A. Kellerman and P. L. Ricker, gives the citation and reproduces the descriptions of nearly 100 genera most of which were published in 1904. The alphabetical arrange-

ments under large groups is the same in style as the first paper published the preceding year. See *Journal of Mycology*, March 1905.

Kellerman, W. A.

THE UREDINEOUS INFECTION EXPERIMENTS IN 1904 by W. A. Kellerman, *Journal of Mycology*, Jan. 1905, deals with cultures made with *Puccinia sorghi* Schw., on the six 'agricultural species' of maize and on *Puccinia helianthi* Schw., on many species of *Helianthus*, *Peridermium pini* on *Campanula americana*, and *Puccinia thompsonii* on *Sambucus canadensis*.

Kellerman, W. A.

OHIO FUNGI, FASCICLE X, W. A. KELLERMAN, *Journal of Mycology*, Jan. 1905, gives (as in case of the nine preceding fascicles) the labels used for exsiccata. These indicate the host, locality, date, collector, and reproduce verbatim et literatim the original description in each case. This set carries the serial No. up to 200.

Morgan, A. P.

A. P. MORGAN GIVES A BRIEF NOTE ON THE GENUS GIBELLULA CAVARA in the March No. of the *Journal of Mycology* (1905), conjecturing the final disposition of the same, then adds a new species, namely, *Gibellula capillaris* Morgan n. sp., growing out of very small dead insects among the old leaves in woods. There are as many as a dozen growing out of one small insect, curved and coiled about it like a bundle of hairs.

Schrenk, Herman von.

HERMAN VON SCHRENK REPORTS ON THE OCCURRENCE OF PERONOSPORA PARASITICA ON CAULIFLOWER, in the 16th Annual Report of the Missouri Botanical Garden, 1906. The interest centers in the fact of the very local and sporadic appearance of the Mildew on this host. Three half-tone plates illustrate diseased leaves.

Hedgcock, George Grant.

GEO. GRANT HEDGCOCK PUBLISHES IN THE 16TH ANNUAL REPORT of the Missouri Botanical Garden (1905) a brief but interesting account of A Disease of Cauliflower and Cabbage caused by *Sclerotinia*. "Cultures carefully taken from the interior of decaying cauliflower stems, quite uniformly produced colonies of a fungus with a white fluffy mycelium. These were transferred and the fungus studied in all its stages and identified as *Sclerotinia libertiana* Fekl." Three plates illustrate the species — showing apothecia, sclerotia, and pure cultures on agar slant tubes.

Magnus, P.

In "Notwendige Umänderung des Names der Pilzgattung *Marssonia* Fisch," von P. Magnus, *Hedwigia*, Band XLV, Heft 2, 16 Jan. 1906, it is noted that *Marssonia* is a phanerogamic genus instituted by H. Karsten in his *Flora Columbia I* (1858-1861), which antedates Fischer's name *Marssonia* (1874) and that the correct spelling is with two *s*'s, instead of only one as given by Saccardo — the genus having been named for Th. Fr. Marsson, Apotheker in Greifswald. Magnus has accordingly changed the name of the genus of fungi from *Marssonia* to *Marssonina*. About two dozen American and all the other species are renamed.

Beardslee, H. C.

The "Amanitas of Sweden," H. C. Beardslee, *Journal of Mycology*, Sept. 1905, is a report of observations of the previous summer. They are notes outlining some of the impressions of an American mycologist, gained from a study of the *Amanitas* with which Fries and his associates were familiar. Nine species are included, viz., *A. verna*, *nuscaria*, *pantherina*, *spissa*, *rubescens*, *porphyria*, *mappa*, *stragulata*, and *vaginata*.

Atkinson, Geo. F.

Geo. F. Atkinson gave in the November No. of the *Journal of Mycology*, 1905, an extended account of the "Genera *Balanisia* and *Dothicloë* in the United States with a consideration of their Economic Importance." It is based on a thorough study of the species; some descriptions and new names are given. The paper is illustrated by eight full page plates.

Sydow, H. et P.

The "Novae Fungorum species — III," auctoribus H. et P. Sydow, includes eight species, three being from North America, one from the Philippines, one from Germany and three from South America. The following new genus is proposed: *Botryoconis* Syd. nov. gen. *Melanconiacearum* — *Acervuli primo subcutanei (ut videtur), demum erumpentes, pulvinato-effusi. Conidia in capitula unita vel botryosoaggregata, colorata, continua.* — *Drepanoconi* Schroet. et P. Henn. videtur affinis.

Hoehnel, Franz v.

"Mycologische Fragmente" von Prof. Dr. Franz v. Hoehnel in Wien, pertains to about eight species all of which have been critically studied. A new genus is proposed, namely, *Unguicularia* which unterscheidet sich von *Pezizella* und *Dasyscypha*, denen die Gattung am nächsten steht, durch die sehr dickwandigen scharf spitzen Haare der Apothecien.

Vuillemin, P.

The "Recherches sur les Champignons parasites de feuilles de Tilleul" (*Cercospora*, *Phyllosticta*, *Helminthosporium*) par le Prof. P. Vuillemin, in *Annales Mycologici*, October 1905, notes a number of species which attack the Lindens. *Cercospora microsora* Sacc. (*C. tiliae* Peck) and *Helminthosporium tiliae* Fries are more fully discussed and text figures are given. Also a new species, from France is discussed: *Phyllosticta bacteroides* Vuill. n. sp. on living leaves of *Tilia silvestris* associated with *Cercospora microsora*.

Sumstine, D. R.

"Another Fly Agaric" is the title of a note by D. R. Sumstine in the November No. of the *Journal of Mycology*, 1905. The author states that flies which had remained on plants of *Amanita olitaria* Bull. for a short time fell over dead. "After two hours the box was again examined, but the flies which once were dead were now alive and had departed with no more serious results possibly than a severe headache from their mycological 'booze.'"

Dietel, P.

In P. Dietel's "Beschreibungen einiger neuer Uredineen," total fourteen species, we find the following pertaining to North America: *Puccinia caricis-polystachyae* Diet. n. sp. on *Carex polystachya* Wahl., Mexico, and *P. solidaginis-mollis* Diet. n. sp. on leaves of *Solidago mollis* Bartl., Utah.

Rick.

Rick, *Fungi austro-americani* Fasc. III u IV. 43-80." *Annales Mycologici*, August, 1906. New species are: *Nectria foli-lax* Rick n. sp.; *Erinella subcervina* Bres. n. sp.; *Rosellinia rickii* Bres. n. sp.; *Chlorosplenium atroviride* Bres. n. sp.; *Lembosia pachyasca* Bres. n. sp.

Fairman, Charles E.

The "Pyrenomycetae novae in leguminibus Robiniae" by Charles E. Fairman, includes descriptions of the following new species: *Leptosphaeria lyndonville*; *L. eustoma* f. *leguminosa*; *Metasphaeria lyndonvillae*; *M. leguminosa*; and *Pleospora aureliana*.

Maire, René.

The interesting article by René Maire in the August No. of *Annales Mycologi*, 1906, entitled "Notes Mycologique," deals with about a dozen species. One that should be noted here perhaps is the parasite of *Lactarius deliciosus* given in Saccardo's *Sylloge* as *Hypomyces deformans*, but is *Peckiella lateritia* (Fr.)

R. Maire. The author found that the spores are verrucose but the cavity not divided, not septate as stated in the description. This species therefore is referred to the genus *Peckiella*. He gives the synonymy as follows. *Sphaeria lateritia* Fr.; *Hypomyces lateritius* Tul.; *Hyp. vuilleminianus* R. Maire; *Peckiella vuilleminiana* Sacc. et Syd.; *Sphaeria deformans* Lagg.; *Hypomyces deformans* Sacc. Syll. "Il est probable qu'un certain nombre d'autres *Hypomyces* devront aussi être rangés dans le genre *Peckiella* lorsque leurs spores auront été mieux étudiées."

Morgan, A. P.

A. P. Morgan gives in the January No. of the Journal of Mycology, 1905, a note on "*Sphaeria Calva* Tode," and furnishes a new description of the plant under the name of *Rossellinia* (*Coniochaeta*) *calva* Tode.

Morgan, A. P.

"A new *Chaetosphaeria*" (*C. ludens* Morgan n. sp.) is described in the May No. of the Journal of Mycology by A. P. Morgan. The plant was growing on old wood of *Acer*.

Lawrence, W. H.

W. H. Lawrence in "Notes on the Erysiphaceae" of Washington, furnishes an annotated list of 17 species.

Ellis, E. and Bartholomew, E.

"Two new *Haplosporellas*" — *H. diatrypoides* E. & B. and *H. cercidis* E. & B. — both collected by Mr. Bartholomew at Natoma, Kansas, are described by J. B. Ellis and E. Bartholomew, in the Journal of Mycology, May 1905.

Beardslee, H. C.

H. C. Beardslee furnishes a brief account of the genus *Clitopilus*, a key to the common species. Two full-page plates and some notes on *C. noveboracensis*, *C. abortivus*, *C. prunulus*, and *C. orcella*, in the Journal of Mycology, May, 1905. The title of the article is "The Rosy spored Agarics or *Rhodosporae*."

Ricker, P. L.

P. L. Ricker in "Notes on Fungi—II, With new species from various localities," gives a description of new species as follows: *Phyllosticta amphipterigii* Ricker n. sp., *Tilletia eragrostidis* Clinton & Ricker, n. sp., *Ustilago duthiei* Ricker, n. sp., *U. sieglingiae* Ricker, n. sp., *Puccinia aeluropi* Ricker, n. sp., *P. kreageri* Ricker, n. sp., *P. paradoxa* Ricker, n. sp., *P. piperi* Ricker, n. sp., & *P. leptospora* n. sp. *Puccinia actinomeridis* Magnus is *P. verbesinae* Schw. and the type host is not *Actinomeris squarrosa* but *Vevesina occidentalis*. See Journal of Mycology, May 1905.

Hedgcock, George Grant.

"A Disease of Cultivated Agaves due to *Colletotrichum*," namely *C. agaves* Cav., is reported by George Grant Hedgcock (see 16th Rep. Mo. Bot. Gar. 1905) as occurring on leaves of *A. americana*, *A. atrovirens*, *A. horrida*, *A. marmorata*, *A. potatorum*, *A. utahensis*, and *A. spp.* — often causing the death of younger plants. No ascigerous stage was found. A half-tone plate shows a plant killed, and one partially killed by the fungus; another shows typical diseased areas with acervuli; and a third illustrates acervuli young and older, setae, conidiophores and conidia.

Hasselbring, Heinrich.

An experimental study has been made by Heinrich Hasselbring of the "Appressoria of the Anthracnoses," published in the August No. of the Botanical Gazette, 1906. These peculiar spore-like organs, produced by the germ tubes of spores, were recognized by Frank in 1883, who observed that they acted as hold-fasts. They were regarded by some investigators as "secondary spores," but Frank first recognized the true nature of these bodies, and gave to all organs of this class the name *appressoria* or adhesion organs. American writers on the bitter rot seem not to have regarded the work done by the foreign investigators and in order to clear up the uncertainty expressed in the literature experiments and observations were made by Mr. Hasselbring whose summary affirms that these spore-like organs formed by the germ tubes of the anthracnose, are adhesion organs, by means of which the fungus is attached to the surface of its host during the early stage of infection. They are not suited for dissemination and therefore are not to be regarded as spores. The adhesion discs are formed as a result of stimuli from mechanical contact acting on the germ tubes.

Bates, J. M.

The "Rust notes for 1904" by J. M. Bates in the Journal of Mycology for May, 1905, deals principally with *Puccinia* on *Distichlis stricta*, a cosmopolitan rust, the aecidia on *Chenopodium*, *Cleome* and *Lepidium*. Reference is also made to *Uromyces astragali* on *Astragalus lotiflorus nebraskensis* Bates, *A. plattensis* and *A. crassicaupus*.

Thom, Charles.

Charles Thom gives "Some Suggestions from the study of Dairy Fungi" in the Journal of Mycology, May 1905. The paper attempts to present a plan for obtaining more definite knowledge of these forms by the dairy student in the use of his own methods.

Morgan, A. P.

"A New Species of *Kalmusia*" by A. P. Morgan, *Kalmusia aspera* Morgan n. sp. is described in the July No. of the Journal of Mycology, 1905. The plant occurred on the hard wood of a prostrate trunk of *Gleditsia*.

Morgan, A. P.

A. P. Morgan gives a short note on "*Peziza pubida* B. & C." in the Journal of Mycology, July 1905.

Davis, J. J.

J. J. Davis publishes "A New Species of *Synchytrium*" — *S. scirpi* Davis n. sp. on leaves of *Scirpus atrovirens* Muhl, Kenosha Co., Wisconsin. See Journal of Mycology, 11:154. Pl. 78, July 1905.

Holway, E. W. D.

E. W. D. Holway gives "Notes on North American *Salvia* Rusts" as follows: *Puccinia verti-septa* Tracy and Gal., *P. caulicola* Tracy and Gal., *P. mitrata* Syd., *P. griseola* Lagh. Also new species, namely, *Puccinia infrequens* Holway n. sp. on *Salvia albicans* and *S. chrysantha*; and *P. nivea* Holway n. sp., on *Salvia purpurea*.

Clevenger, Joseph F.

The "Notes on some North American *Phyllachoras*" by Joseph F. Clevenger in Journal of Mycology, July 1905, pertains to *Ph. trifolii*, *Ph. ambrosiae*, *Ph. diplocarpi*, *Ph. graminis*, *Ph. lespedezae*, *Ph. cornuospora*, *P. junci*, illustrated by twenty-four outline drawings.

Lawrence, W. H.

"Blackspot Canker and Blackspot Apple Rot," *Macrophoma curvispora* Peck, *Gloeosporium malicorticis*, *Myxosporium curvisporium* (Peck) Sacc. in Litt., occurring in British Columbia, Western Oregon, and Western Washington where it is prevalent, also descriptive notes are given. See W. H. Lawrence in Journal of Mycology, July 1905.

Sumstine, D. R.

Under the caption of "*Gomphidius Rhodanthus* Once More," D. R. Sumstine, in July No. of the Journal of Mycology, 1905, gives the synonymy as follows: *Clitocybe pelletieri* Lév., *Paxillus paradoxus* Cooke, *Flammula paradoxa* Kalch., *Flammula Tammii* Fr. And this is the proposed new name: *Boletinus rhodanthus* (Schw.) Sumstine n. n.

Hedwegia, Band XLIV, Heft 4, Apr. 1905.

In this No. of Hedwegia we find a single article to note, viz., Lichenologisches, von Max Britzelmayer. The subheads of the article are: I. Lichenen vom Hochfeln und Hochgern; II. *Cladonia gracilis* L.; III. *Cladonia rangiformis* Hoff.; IV. *Scidella goniophila* Flk.

Rabenhorst's Kryptogamen-flora, Pilze, 100. Lieferung, 30 Aug. 1906.

The 100 Lieferung of Rabenhorst's Kryptogamen-flora (by Dr. G. Lindau) issued 30 Aug. 1906, completes the genus *Ramularia*; also the Abteilung *Hyalohelicosporaceae* and *Hyalos- taurosporac.* The family *Dematiaceae* is then taken up, the Unterabteilung *Coniosporaceae* completed and the Unterabteilung *Toruleae* begun. New species described are: *Ramularia helvetica* on *hieracium albidum*; *R. hamburgensis* on *Hieracium vulgatum*; *Coniosporium caricis-montanae* on *Carex montana*, *C. papyricola*; *Fusella typhae* on dead leaves of *typha latifolia*.

Annales Mycologici, vol. IV. No. 4. Aug. 1906

The contents of *Annales Mycologici*, Aug. 1906, are: Dietel, P., Beschreibungen einiger neuer Uredineen; Rick, Fungi austro-americi Fasc. III. u. IV; Fitch, Ruby, The Action of Insoluble Substances in Modifying the Effect of Deleterious Agents upon the Fungi; McAlpine, D., Australian *Acacia* Rusts with their specific Hosts; McAlpine, D., A new *Aecidium* on *Acacia*; Fairman, Charles E., *Pyrenomycetaceae novae in leguminibus Robiniae*; Maire, René, Notes mycologiques; Rehm, H., *Ascomycetes novi*; Rehm, Zum Gedächtnis an J. B. Ellis; Sydow, H. et P., *Novae Fungorum species* — III; Neue Literatur; Referate und Kritische Besprechungen.

Rehm, H.

Under "*Ascomycetes novi*" H. Rehm describes in *Annales Mycologici*, August 1906, (1) *Ascomycetes Americae borealis*, seven species; (2) *Ascomycetes hungarici*, three species; (3) *Discomyces gallicus*, one species; (4) *Discomyces graecus*, one species; (5) *Pyrenomyces Africae australis*, one species.

Fink, Bruce.

In an article in the *Bryologist* for March 1906 (9:21-4), Bruce Fink gives "Further Notes on *Cladonias* VI," discussing *Cladonia cariosa*, *Cladonia cariosa corticata* Wainio, and *Cladonia squammulosa* (Mull.) Wainio.

VanHook, J. M.

"*Ascochyti pisi*, a Disease of seed peas," published in the Ohio Naturalist for April 1906 (6:507-512) by J. M. Van Hook, reports the exceptional blighting of peas throughout Ohio during the season of 1904 and 1905. It is noted as the most important thing in connection with the life history of the fungus, that it grows through the husk into the seed. Frequently, when the pod contains no seed, the mycelium will grow through, forming similar spots on both sides of the pod. When the mycelium passes into the seeds brown spots are formed on the surface. Pycnidia are formed on the dead areas of the stems, leaves, pods, and seed, and even on the dead stems and branches. Cultures are reported; also seed treatment with mercuric chloride and with formalin, the results for the most part not only unsuccessful but negative. As hosts are named all the examined varieties of the common pea; but the reported hosts *Medicago sativum*, *Cicer arietinum*, *Phaseolus vulgaris* and *Vicia villosa* were here free.

Holway, E. W. D.

E. W. D. Holway gives in the Journal of Mycology, Nov. 1905, "Notes on Uredineae IV," these being *Puccinia uniformis* Pam. & Hume; *P. oblicus* B. & C.; *P. fragilis* Tracy & Gal.; *P. purpusii* P. Hen.; *P. arabicola* E. & E.; and *Uromyces oblonga* Vize.

Sturgis, W. C.

W. C. Sturgis, under the title "Remarkable occurrence of *Morchella esculenta* (L.) Pers.," says: "On September 11th the writer was skirting the precipitous side of a mountain at an altitude of about 7,000 feet, and while passing through what had been a fairly good growth of aspens and small spruces, a few fine specimens of *Morchella* were noticed. Further search revealed the presence of these plants literally in hundreds. A fire had passed across the mountain in June, 1904, leaving only skeletons of the trees standing and charring the ground to such a depth that no trace of green vegetation had since appeared. Yet under these unfavorable circumstances and at a season when snow had already fallen not far from the locality, a bushel of *Morchellas* might have been gathered within a radius of one hundred yards." See Journal of Mycology, November 1905.

Sherman, Helen.

Helen Sherman gives the "Host plants of *Panaeolus epimyces* Peck," in the Journal of Mycology, July 1905, with a full page illustration, showing a well-developed plant attached to its host, a later stage of the same, also very young carpophore.

INDEX TO NORTH AMERICAN MYCOLOGY.

Alphabetical List of Articles, Authors, Subjects, New Species and Hosts, New Names and Synonyms.

W. A. KELLERMAN.

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- ACER sp., branches, host to *Valsa rhodospora* Sacc. n. sp. *Ann. Mycolog.* 4:275. 5 June 1906.
- ACER, cortex, host to *Diplodina anomala* Sacc. n. sp. *Ann. Mycolog.* 4:277. 5 June 1906.
- ACER, trunk, host to *Naemosphaera fairmani* Sacc. n. sp. *Ann. Mycolog.* 4:276. 5 June 1906.
- ACHILLEA ptarmica, host to *Hypoderma ptarmicola* Fairman n. sp. *Proc. Rochester Acad. Sci.* 4:216. March 1906.
- ADENOSTOMA fasciculatum, host to *Polystigma adenostomatis* Farlow n. sp. Ellis & Everhart's *Fungi Columbiani* No. 2049. 1905.
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- AGARICUS campestris, see *Development of [abstract]* . . .
- AGARICUS nigripes Schw., syn. of *Heliomyces nigripes* q. v.
- AGAVES, cultivated, Disease of, see *Disease of* . . .
- AGUACATE, see *Persea gratissima*. . .
- AILANTHUS glandulosa Desf., host to *Diaporthe ailanthi megacerasphora* Fairman n. var. *Proc. Rochester Acad. Sci.* 4:220. March 1906.
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- AMPHISPHERA bertiana Fairman n. sp., in moist cavities in the end of a rotten log. Proc. Rochester Acad. Sci. 4:217. March 1906.
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- ANEMONE tetonensis, host to Pyrenophora ampla Syd. n. sp. Ann. Mycolog. 4:343. Aug. 1906.
- ANONA cherimolia, host to Bonansea mexicana Sacc. n. sp. Jour. Mycol. 12:51. Mar. 1906.
- ANTHROCNOSSES, see *Appressoria* of . . .
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(To be continued.)

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EDITOR'S NOTES.

The proposition that the diagnosis of new species shall be in Latin has been discussed by many of the American botanists—and the verdict seems to be favorable. How it could be otherwise is not clear. And yet it is almost ludicrous if not appalling to contemplate the quality of 'Latin' that henceforth will be inflicted upon the botanical world; remembering that a few members of the profession admit their ill knowledge of this idiom, and we suspect that some besides may presently betray noticeable ignorance.

It is not an unmitigated reflection to say that only a few scientific men in this country are latin scholars, or are so familiar with this language that they are able to dash off a Latin description as quickly as they would indite an English diagnosis of the species. Many have earned a reputation as botanists—in spite of ignorance in other directions of which possibly they might be accused.

Why should the worker not then write what he has to say, with the necessary exactness and conciseness, using his mother tongue; let the world have this product, but at the same time accompany the diagnosis with the Latin translation which the author himself makes or at least supervises. This would seem to be feasible so far as original publication of species in periodicals is concerned. In extensive compilations, monographs, etc., the Latin alone would be used.

We make a slight innovation in the JOURNAL by way of employing **black type** for names of new species and for sub-heads (authors' names) in the Notes from Mycological Literature, a plan to be followed in the future.